

ESD Rubber Tile Installation

1. General Preparation and Conditioning

Read the literature concerning the product description, product limitations, product installation, adhesive information, product maintenance and warranty before installing the tile. All materials including recommended adhesive are to be delivered to the installation location in its original packaging with labels intact. **DO NOT** stack pallets of material as this will cause damage. Store products in a dry area protected from the weather on a smooth, flat, dry surface with temperatures maintained between 65° F (19° C) and 85° F (30° C). Remove all plastic wrapping and strapping from the pallets upon arrival to the installation area and at least 48 hours prior to installation. For proper acclimation, remove the tile from the cartons and stack evenly on a smooth dry surface with each stack no more than 18" high. When stacking tiles prior to and during installation, place the tiles face-to-face and sanded back-to-sanded back to prevent the sanded back of the tiles from being contaminated and to protect the product from damage. The installation area, tile, adhesive and welding rods are to be maintained between 65° F (19° C) and 85° F (30° C) for a minimum of 48 hours prior to installation. These temperature ranges must be maintained throughout the installation phase and thereafter. If temperatures other than Flexco's requirements become an issue, contact the Flexco Technical Service Department prior to installation. **Notice:** Tile should be loose laid in the room or area prior to spreading of adhesive to determine the proper layout to ensure the best overall appearance and to minimize small border cuts. Inspect all material for proper type and color. Conduct the proper moisture emission and pH testing on the substrate. Proceed with the installation only when the conditions are proper and correct. A bond test using Flexco 66/67 Solvent Free ESD Epoxy Adhesive throughout the area approximately 50 feet apart should be performed at least one week prior to the scheduled installation to ensure the surface is suitable. After 72 hours, there should be an unusual amount of force to lift tile from the substrate with adhesive bonding to the tile and the substrate. **Caution:** Close the area to traffic during flooring installation and 48 hours after installation. Install tiles and accessories after other finishing operations, including painting, have been completed. If the back of the tile becomes soiled prior to installation, clean with a clean soft cloth dampened with clean water or denatured alcohol and allow to completely dry. Tile may be installed over radiant heated floors, provided the surface temperature is maintained between 65° F (19° C) and 85° F (30° C). If radiant-heated floors have cooled after installation, a gradual increase in temperature is required to prevent adhesive bond from being adversely affected. Follow all local, state, and federal standards and practices for the proper removal and disposal of flooring, adhesives, or other materials. Follow all local, state, federal, and manufacturer's safety standards for the use of all products and equipment.

2. Subfloor/Substrate Inspection and Preparation

2.1 General

All subfloors/substrates must be inspected prior to installation. All substrates must be clean, smooth, permanently dry, flat, and structurally sound. The substrate must be free of moisture, dust, sealers, paint, curing compounds, parting agents, residual adhesives, adhesive removers, hardeners, resinous compounds, solvents, wax, oil, grease, asphalt, gypsum compounds, alkaline salts, excessive carbonation or laitance, mold, mildew, any other extraneous coatings, films, materials and all other foreign matter which might interfere/restrict proper adhesive bonding. **DO NOT** use sweeping compounds, solvents, citrus adhesive removers, or acid etching to clean the substrate. **DO NOT** install flooring over gypsum-based or plaster based leveling or patching compounds. **DO NOT** install new floor covering over old floor covering, as the old floor covering may not be adequately bonded, hide possible structural defects or cause plasticizer migration into the new flooring. In renovation or remodel work, remove all existing adhesive residue so that 100% of the overall area of the original subfloor/substrate is exposed (**Caution:** Some previous manufactured asphaltic "cutback" contained asbestos). Follow The Resilient Floor Covering Institute's (RFCI) "Recommended Work Practice for Removal of Existing Floor Covering and Adhesive", and all applicable industry, local, state, and federal standards. Care must be taken to analyze the conditions and correct any problems prior to installation. Follow the manufacturer's recommendations for any patching or underlayment materials, excluding gypsum based or plaster based levelers or patching compounds.

2.2 Concrete Substrates

Concrete substrates on all Grade Levels must be tested in accordance with ASTM F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride or ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs using *in situ* Probes to quantitatively determine the amount of moisture vapor emission at least one week prior to the installation. **Caution:** ASTM F 1869 or ASTM F 2170 tests cannot predict long-term moisture conditions of concrete slabs. Moisture testing only indicates moisture conditions at the time the tests are performed. Before conducting ASTM F 1869 or ASTM F 2170 test, the installation area must be maintained between 65° F (19° C) and 85° F (30° C) or at least 48 hours prior to testing, during testing and thereafter. In addition, the concrete's temperature range must also be identical to that of the installation area. Conduct three tests for the first 1,000 sq. ft. and one additional test for each 1,000 sq. ft. or fraction thereof per grade level (on, below or above grade). The Vapor Emission Rate shall not exceed 5.0 lbs and Relative Humidity Test shall not exceed 75% when using Flexco 66/67 Solvent Free ESD Epoxy Adhesive. If the substrate does not meet the above noted requirements, the flooring shall not be installed until the problem has been corrected. **DO NOT** install flooring if

there is hydrostatic pressure. Every concrete floor slab on-grade or below grade to receive resilient flooring shall have a permanent, effective moisture vapor retarder installed below the slab. A pH test must be performed to test for excessive alkalinity using a pH pencil or litmus paper and deionized water. A scaly, sandy, or powdery surface is an indication of some form of contaminant, usually excessive alkalis or an alkali-silica residue. A pH reading higher than 8 is an indication of a potential problem and the concrete must be neutralized by rinsing with clear water. Apply clear water with a mop and allow to thoroughly dry. Re-rinse with clear water, allow to thoroughly dry and retest to ensure pH level is within acceptable range of 5 to 8 on the pH scale. Continue to neutralize until the pH level is acceptable. The testing of concrete for alkalinity indicates the degree of alkalinity only at the time the test is conducted, and cannot be used to predict long-term conditions. Moisture and alkali salts in the concrete can cause the following problems after installation: adhesive deterioration, bumps, ridges, bubbles, discoloration, mold, mildew, bacteria growth, efflorescence, tile shifting, tile releasing, tile peaking and/or sheet seam curling. **DO NOT** install over burnished (slick troweled) concrete to avoid adhesive and underlayment patch or self-leveling bonding problems due to the non-porosity of the concrete finish. Corrective measures such as bead blasting (shot blasting) or scarifying must be performed prior to installation. The concrete slab must be of good quality, standard density concrete with low water/cement ratios consistent with placing and finishing requirements, having a maximum slump of 4", a minimum compressive strength of 3500 PSI, and following the recommendations of ACI Standard 302.1R-96 for class 2 or call 4 floors and the Portland Cement Association's recommendations for slabs on ground. Joints such as expansion joints, contraction joints, isolation joints, saw cuts, control joints, grooves or other moving joints shall not be filled with patching compound or covered with resilient flooring. Expansion joint covers designed for use with resilient flooring should be used. Any non-moving surface cracks, depressions, and other irregularities shall be filled and smoothed with a high quality grade Portland cement-based, water resistant, non-shrinking, non-staining, mildew resistant, alkali resistant underlayment having a minimum compressive strength of 3500 PSI after 28 days. Some underlayments may fail under excessive weight; an epoxy caulking compound may be required for certain repairs. Mechanically cleaning the substrate by shot-blasting, scarifying and/or sanding shall be performed to achieve a flat, smooth, clean surface to prevent irregularities, roughness or other defects from telegraphing through the new resilient flooring. The surface of the concrete shall be flat to within the equivalent of 3/16" in 10 feet, as described in ACI 117R. The surface shall be cleaned of all loose material by scraping, brushing, vacuuming and/or other methods immediately before commencing installation of resilient flooring. Follow the proper safety practices during the preparation and installation. Follow the recommendations of the American Concrete Institute (ACI 302.1R, *Guide for Concrete Floor and Slab Construction*; ACI 360.R, *Design of Slabs on Grade*; ACI 223, *Standard Practice for the Use of Shrinkage-Compensating Concrete*); The American Society for Testing and Materials (ASTM F 710, *Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring*), and the American National Standards Institute (ANSI A157.1, *Recommended Practice for Concrete Floor and Slab Construction*) for the preparation of concrete to receive resilient flooring.

2.3 Wood Subfloors

Wood subfloors should be of double layer construction with a minimum thickness of 1". Crawl spaces underneath wood subfloors shall be in compliance with local building code ventilation practices and have clearance of at least 18" of cross-ventilated space between the ground level and joists. Wood joists should be spaced on not more than 16" centers. Place a moisture retarder; having a maximum rating of 1.0 perm, on the top of the ground under the wood subfloor overlapped at least 8". APA, The Engineered Wood Association, Underlayment Grade plywood, minimum 3/8" thick, with a fully sanded face is to be used. Use APA approved exterior grade plywood if finished floors are subjected to moisture. OSB, lauan, maranti, solid-core mahogany, waferboard, particleboard, chipboard, flakeboard, tempered hardboard, glass mesh mortar units or cementitious tile backer boards, sheathing-grade plywood, preservative-treated plywood and/or fire-retardant treated plywood are not recommended as some manufacturers may use resins or other adhesives in the manufacturing of the product that may cause discoloration or staining of the flooring. Wood subfloor movement, flexing or instability will cause the flooring installed to release, buckle or become distorted. Do not proceed with the installation until corrective measures have been made. The warranties, performance, installation and uses are the responsibility of the wood subfloor manufacturer and/or contractor. **DO NOT** use plastic or resin filler to patch cracks. **DO NOT** use cement or rosin coated nails/staples, or solvent-based construction adhesive to adhere the plywood. Installation on a sleeper, a wood subfloor system constructed over the top of concrete, is not recommended. Installation directly over Sturd-I-Floor panels is not recommended. All wood subfloors, single construction plywood floors, single and/or double tongue-and-groove strip floors, and wood plank floors must be prepared to receive resilient flooring in accordance with federal and industry standards. Follow the recommendations of the APA, The Engineered Wood Association, Design/Construction Guide, Residential and Commercial, and ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use under Resilient Flooring, for the installation and proper construction of the panels to receive resilient flooring. It is the contractor's responsibility to determine if the subfloor is acceptable to receive the flooring (Refer to 6.2.1).

2.4 Terrazzo and Ceramic Floors

Terrazzo and ceramic floors to be used as subfloors/substrates are to follow the procedures recommended for concrete in 6.2.2. Ceramic tile must be solidly adhered and all loose tiles must be removed and repaired or replaced. Ensure all glazed, sealed, smooth and/or shiny surfaces are properly sanded and cleaned. Fill all grout lines and other irregularities with a Portland cement-based underlayment with a minimum compressive strength of 3500 PSI. The subfloor must be structurally sound. Inspect and

ensure there is an adequate bond of the old flooring to the original substrate. Flexco will not warranty the product if there is a bond failure caused by problems relating to the old flooring (Refer to 6.2.1).

2.5 Metal Floors

Metal floors to be used as subfloors/substrates must be thoroughly cleaned of any residue, oil, rust and/or oxidation and properly sanded/grinded to provide a smooth, level, clean substrate to receive the resilient flooring. The flooring must be installed within 12 hours after sanding/grinding to prevent the metal flooring from re-oxidizing. The metal subfloor shall be structurally sound.

Deflection of the metal floor can cause a bond failure between the adhesive and the metal substrate. On an extremely smooth, non-porous, metal substrate, a longer “tack up” may be required in order to prevent the adhesive from oozing between the seams.

Caution: The installation of stair-treads, risers or other flooring materials will not prevent deterioration of metal substrates from occurring.

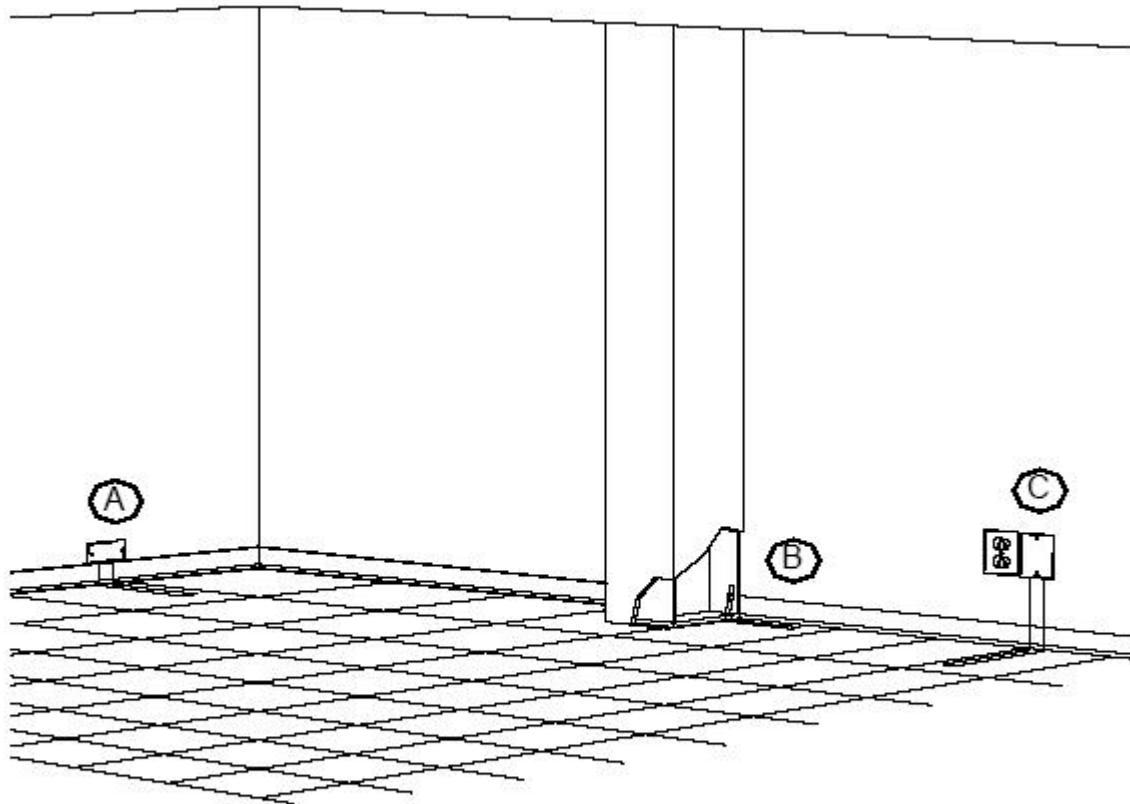
3. Product Installation

3.1 Installation

When laying the flooring use a kneeling board, or for best results, work off the flooring whenever possible to avoid shifting of the tile. Ensure the epoxy adhesive is not tracked onto the surface of the tile. If the adhesive is bleeding or oozing at the seams, either too much adhesive is being applied or the adhesive is too wet. Immediately remove the excessive wet adhesive with a clean cloth dampened with warm soapy water or denatured alcohol before the epoxy cures. After cleaning with denatured alcohol, rinse with a clean soft cloth dampened with clean water. **DO NOT** allow the epoxy to cure on the surface of the tile; it will be extremely difficult to remove. **Note:** If heat welding, the rubber welding rods will not adhere to adhesive left remaining in the pre-grooved seam. Periodically, lift the tile to check for proper adhesive transfer. There should be at least a 90% transfer of adhesive on the back of the tile. Also observe the adhesive to ensure the adhesive has not surpassed its open time and started to cure. Borders and other specialty cut tiles must be scribed and cut fit snugly but not tightly, against the wall, threshold, transition strip, fixtures and/or other obstacles. **DO NOT** wait until all the main aisle flooring has been installed to begin laying the borders. Roll and cross roll each section of tile laid with a 100-pound, 3-section roller within 20 minutes after the tile section has been installed. Use a hand roller in areas that cannot be reached with the larger roller. Conduct a visual inspection during the rolling process to ensure there has been no shifting of the tiles and that there is no adhesive on the surface of the tile. **DO NOT** wait until the entire installation is completed before rolling as the adhesive may have surpassed its open time. Inspect each section laid after rolling to check for raised edges. Roll and cross roll a second time approximately 30 minutes after the initial rolling. If necessary, roll and cross roll again. There is to be no foot traffic on the floor for at least 48 hours and no wheeled conveyances for at least 3 days. Protect flooring against damage.

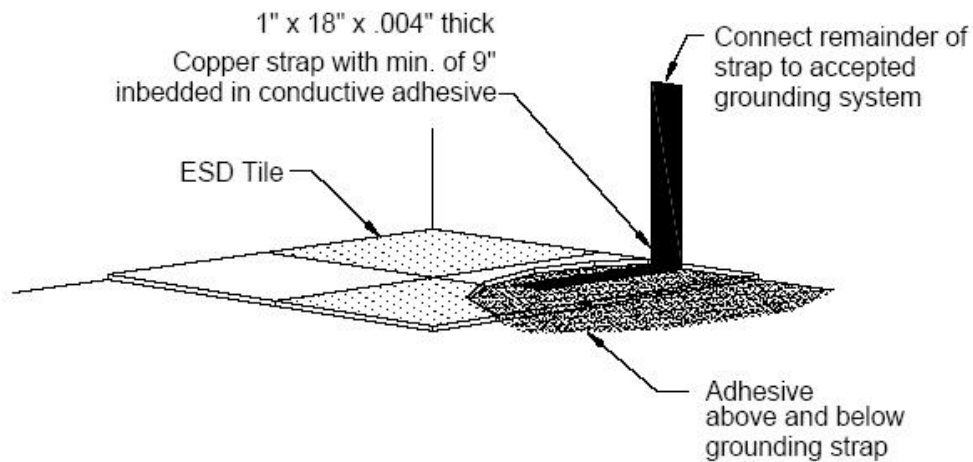
3.2 Grounding & Grounding Diagram

To ground the conductive flooring to a known ground, use the 1” wide x 0.004” thick x 18” long copper foil strips which are supplied by Flexco. Place approximately 9” of the strip into Flexco 66/67 Solvent Free ESD Epoxy Adhesive while the adhesive is still wet to ensure a 100% transfer to the copper foil backing, under the tile nearest the ground point. Flexco 66/67 ESD Adhesive must also be applied to the top section of the copper foil strips in order to complete the conductivity and to bond the tile to directly to the copper foil strips. Allow the other half, approximately 9”, of the length of the strip to “pigtail” up the wall to permit an electrician to mechanically connect the copper foil to the ground point. If using a specifically supplied ESD facility grounding system, a ground bus bar would be placed near the floor where any ESD ground can be connected. If bus bars are not used, the ESD ground wire is normally #10 or #12 stranded copper wire supplied by the electrical contractor, is placed inside the wall from a ground bus and a hole is cut into the drywall for the wire to exit at the floor/wall junction where the copper foil has been placed. Grounding to the green wire ground in the wiring system may also be used; Refer to the Grounding Diagram that follows. Use longer copper foil strips if necessary. Place the copper strips approximately every 2000 square feet along the perimeter of the floor or where the ground points are located and/or at least one per room. The ground connection may also be made directly to an exposed steel support column. The connection must be mechanically secured to the column. The point of contact on the column must be clean and dry, and free of any paint or other substance that would prevent adequate metal contact. Protect or enclose all connections as required by safety codes. Make sure that all expansion joints, saw-cuts and other necessary openings are bridged with a copper strip to ensure continuity. Resistance testing should be conducted in accordance to the test method, voltage, and conditions specified.

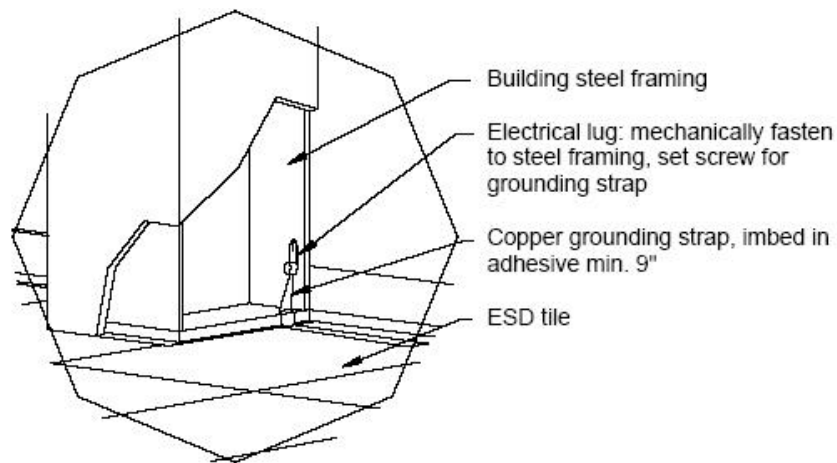


Common accepted ESD Tile system grounding methods

- A. Specific ESD grounding system built into the facility design.
- B. Building column: Steel columns or grounded building framing system provides an acceptable ground for ESD flooring. Grounding lug fastened to steel framing per NEC requirements
- C. Connect the copper strap to the green ground wire jumpered from a receptacle box.

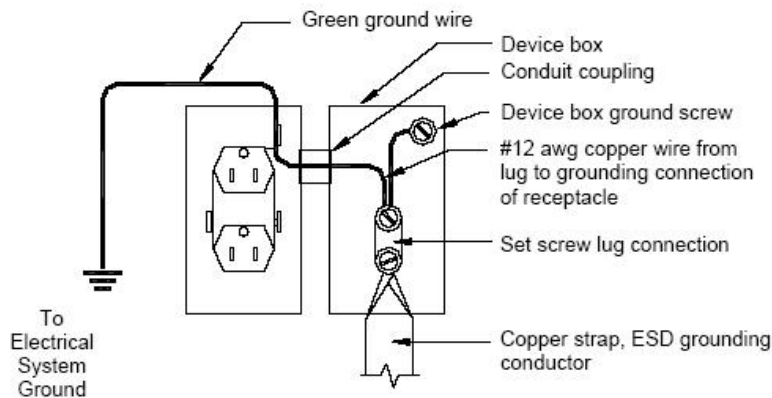


Strap installation detail



Note: Steel building frame must be properly grounded

Detail (B)



Detail (C)

3.3 Flash Cove Procedure

Install field tile prior to flash cove. Allow a minimum of 6" flash up the wall and extending at least 6" on the floor. Install the desired Flexco Resilient Cove Cap at the desired height. Install metal inside and outside corners, making sure cove cap and corner height match. Corners can be formed on the job site. Install the Flexco #195 Cove Stick Filler at the wall and floor junction to provide the desired radius. Measure and cut in your flash cove. Using a heat gun, heat the tile uniformly over the entire length and bend to desired radius, making sure you have good contact with the cove stick. Use a piece of scrap to test bending procedure and **DO NOT** overheat tiles. To make both inside corners and outside butterfly corners, use building felt to create a dry pattern. Cut the tile to the pattern. Heat it, trim it and fit into place. For outside corners, after cutting and grooving your butterfly piece, heat it, and fit into place. Use a hand grooving tool on the butterfly piece and the rest of the corner at the point where they meet to prepare them for heat welding. As an alternative, preformed metal corners may be used. All flash cove sections should be pre-formed and allowed to cool prior to spreading adhesive. Final heating and forming should be made after adhesive has been applied. Use Flexco 16/86 Multi-Performance Tile and Tread Adhesive on the wall for installation of flashed-cove pieces of tile. Use Flexco 66/67 Solvent Free ESD Epoxy Adhesive on the floor and allow the adhesive to overflow on the cove strip. Weld the flash cove tile to the field tiles and up the wall. Trim flash cove seams using an X-ACTO knife with a blade to make it easy to trim inside and outside corners.

3.4 Unitized Heat Weld Procedure

DO NOT heat weld the seams until the adhesive has cured, approximately twenty-four (24) hours after the installation of the flooring. After installation and prior to heat welding, protect all seams from dirt, topical moisture and cleaning of any kind. **DO NOT** allow the adhesive to bleed at the seam. The Vinyl welding bead will not weld to the adhesive. If the installation is to be routed on the job, the preferable method is to use an electric grooving machine with the blade set to cut the groove approximately 66% of the total thickness of the tile (.052", if the flooring is .080" thick). During the grooving process, ensure approximately 50%

of material is equally removed from each side of the adjoining pieces of the tile that is being grooved. Practice on a piece of scrap tile to obtain the proper depth. Temperature of the flooring and welding bead prior to and during installation must be between 65° F (19° C) and 85° F (30° C). It may be necessary to hand groove some of the seams using a hand grooving tool with a narrow blade near the walls or other obstacles. While grooving, pre-heat the welding gun as recommended by the manufacturer. After the grooving is completed use a hot air welding gun, insert the Flexco Vinyl Welding Bead through the opening of the 4mm welding tip into the center of the routed groove in the flooring. Practice the welding technique by using a piece of scrap tile to determine the temperature setting of the heat gun and welding speed to achieve a successful bond. Ensure the groove and welding bead are clean, dry and free of any contaminant that may prevent a successful bond when heat welded together. Follow the recommended welding procedures provided by the welding gun manufacturer. Begin welding at the wall and move toward the center. You can see the tile and bead flowing together while welding if the settings are correct. Welding too slowly may char or burn the tile. An excessive welding speed will not allow the bead and tile to reach the proper temperature for a successful bond. Ensure sufficient downward pressure is applied to fill the groove. Work with seams in one direction at a time, cut a “V” groove in installed bead at tile intersections, and then complete the procedure in opposite direction. **DO NOT** Allow traffic until rods have cooled and are trimmed. Allow the welding bead to completely cool and trim the excess bead with a clean, sharp quarter moon spatula knife with an attached clean, trim plate. After one hour, perform a second trim using only the quarter moon spatula knife to create a smooth, level surface. If the heat welded seam is trimmed before it is completely cold, and/or, if the seam is first cut with only the quarter moon spatula knife without trim the trim plate, a concave skive can result. This can allow particulate and liquids into the seam. After trimming, carefully glazing the surface of the heat welded seam with the hot air from the gun may smooth out any imperfections.

4. Testing for Electrical Resistance

Flexco recommends that the ESD Rubber flooring system be tested for electrical resistance approximately seven (7) days after the installation. The adhesive must be allowed to properly cure and the flooring system to stabilize to the ambient conditions. The electrical resistance will be tested according to ASTM F 150, ANSI/ESD S7.1-2005, NFPA 99, and UL 779. Conduct testing at 100 volts for the ESD Rubber Tile. Perform both point to point and point to ground tests. Conduct additional testing according to any special test method or procedure as specified by the customer in the specification.

COMPANY INFORMATION

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